particularly succesful in integrating the electrophysiological and biochemical views of these processes, and, as might be expected, in emphasizing the roles of ion-channels in modulating them.

The second section (eleven chapters) is mainly devoted to the molecular mechanism of action of channel proteins, and progresses from considerations of the behaviour of ions in solution and the conductive properties of pores to the development of molecular models for conduction, and the blocking and gating of channels. It closes with short accounts of the expression of channel-protein genes, and the targeting of their products, and of channel evolution and diversity. Once again the material is viewed primarily from an electrophysiological standpoint, but will be found accessible by biochemists with biophysical leanings.

The size of this book and the amount of detail it contains probably disqualify it as a general undergraduate text – Stein's 'Channels, Carriers and Pumps', with its much broader coverage, meets this need admirably – but final-year biochemists, pharmacologists and physiologists will surely find in it much that is valuable to them. To those teaching or carrying out research in this field it will be indispensible, as the most compendious and illuminating single volume available on this fast-growing topic. It is up to date (references up to 1991), very nicely produced and, as specialist books go, not expensive: there can be no reservations in recommending it.

D.K. Apps

Progress in Membrane Biotechnology; Edited by J.C. Gomez-Fernandez, D. Chapman and L. Packer; Birkhäuser Verlag; Basel, 1991; viii + 340 pages. SFr 98.00, DM 118.00. ISBN 3764326662

This book contains twenty-three contributions and is a useful addition to the literature on membrane biotechnology. Membrane biotechnology is a relatively new and rapidly expanding area of research and the topics covered, in depth, in this book range from basic membrane studies to some recent technological applications.

A major theme of this book is the importance of protein–lipid interactions to the development of membrane biotechnology. The techniques used in the study of biomembrane structure, in particular the use of Fourier transform infrared (FTIR) spectroscopy to examine membrane proteins, are covered in the first contribution (pp. 1–11). This is followed by a contribution (pp. 12–29) on the use of time- resolved X-ray diffraction methods in conjunction with thermal and densitometric measurements to characterise phase transitions in lipid– water systems. A guide to the use and development of computer-based molecular graphics for the representation of lipid structures, e.g. NanoVision (allows skeletal, ball-and-stick and van der Waals depictions) is found in the fourth contribution (pp. 40–51). An examination of the structural activity of platelet activating factor (PAF) in the membrane lipid bilayer in comparison with non-bioactive asymmetric phospholipids is made in the ninth contribution (pp. 118–139).

The location and dynamics of the lipophilic chain-breaking antioxidant, α-tocopherol (it donates a hydrogen to lipid peroxyl and alkoxyl radicals, thus terminating the chain reaction of peroxidation by scavenging chain-propagating radicals), in membranes is examined in the eight contribution (pp. 98–117). The ability of α-tocopherol to be enzymically regenerated from its chromanoxyl radical (formed as a result of labile hydrogen donation) enables it to protect and stabilize membranes against free radical-mediated oxidation, and this is discussed in the tenth contribution (pp. 141–154).

Liposomes are important in pharmaceutical, biological and medical research and have been found to be highly effective carriers for vaccines (thirteenth contribution, pp. 195–202). Anti-cancer drugs, in particular anthracyclines and platinum compounds, have been successfully encapsulated in liposomes. This liposomal approach is being used in the therapy of ovarian cancer with doxorubicin (fourteenth contribution, pp. 203–213). Another interesting liposomal application is the use of liposomes to encapsulate haemoglobin to form a red blood cell substitute. This can be used in the production of an artificial oxygen-carrying fluid (blood replacement) for use in transfusions (fifteenth contribution, pp. 214–226).

The plasma membrane of tumour cells is of importance in relation to the clinical problem of cellular multidrug resistance, and has also recently been proposed to be directly involved in the mechanism of action of the drug, tamoxifen, which is used in both the treatment and more recently the prevention of breast cancer. In the sixteenth contribution (pp. 227–239) it is reported that decreased cholesterol and increased phosphatidylserine content increases the binding and thus the effectiveness of the anthracycline anti-cancer drug, daunomycin. This is in contrast to the mode of action of tamoxifen, which is thought to structurally mimic the ability of cholesterol to stabilize the plasma membrane and thus hinder cancer cell proliferation.

A most useful feature of this informative book is that the contributions contain a Materials and Methods section. The references do tend to be rather brief, however, and the index would certainly benefit from expansion. This book will be of great benefit to research workers in the many and diverse subject areas encompassed by membrane biotechnology.

Helen Wiseman
